



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address COMMISSIONER FOR PATENTS
P.O. Box 1099
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10017,140	10/30/2001	Tom Kleiner	SD6053-US-1	1014
<div> <div>5179 7590 01/25/2004</div> <div>PEACOCK MYERS AND ADAMS P C</div> <div>P O BOX 26927</div> <div>ALBUQUERQUE, NM 871256927</div> </div>				
<div>EXAMINER</div> <div>KALAFUT, STEPHEN J</div>				
ART UNIT		PAPER NUMBER		
1745				

DATE MAILED: 01/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
10/017,140	KLITSNER ET AL.
Examiner	Art Unit
Stephen J. Kalafut	1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is set or extended above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) none.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims are confusing because they recite that the film comprises an electrode, and that it comprises two layers, but does not say whether either of these layers are the electrode itself, part of the electrode, or distinct from the electrode. The claims also do not point out which layers are "etch-processed". There is no antecedent for "said support substrate" in claim 11 or its parent claims 1 and 10. Should claim 11 instead depend from claim 8?

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5-9, 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hockaday (US 5,631,099).

Hockaday discloses a fuel cell including a three-layer film which includes a dielectric layer (19), a conductive layer (17) made of gold or platinum (column 11, lines 39-43), and a catalyst layer (13) made of platinum and ruthenium (column 11, lines 52-56). Since these layers are penetrated by pores (63, 65), the dielectric layer (19) would also be porous. How the catalyst was deposited is treated under product-by-process practice, in re Fitzgerald 205 USPQ 594, the process limitations given no patentable weight. See also MPEP 2113 and the cases cited therein. The three-layer film is also disposed next to a fibrous matrix (67), which would serve as a

support substrate. The gaps (69) in the matrix would serve as fuel flow paths. While the fuel cell is operable to produce electricity from hydrogen and oxygen (column 7, lines 23-27). While not specifically mentioned, the cell would be able to operate in reverse, thus electrolyzing water. The various pores are made by nuclear particle track etching (column 4, lines 21-26). The layers would thus meet the present recitation of being "etch-processed".

Claims 1, 5-7 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Hockaday (US 5,759,712).

Hockaday discloses a fuel cell which includes a porous fuel manifold (70) made of PTFE or polypropylene (column 8, lines 61-65), which are dielectric, next to a platinum/ruthenium conductive layer (75), which includes pores (73), thus disclosing a conductive porous film. Below this film is a Pt/Ru catalyst coated on carbon, deposited as an ink (column 8, lines 32-45), to form particles (76). Plural fuel cells are assembled into a planar array, as seen in figure 8. Since the metal layer (75) is porous, it would have an etched structure, since etching is a way of removing material, and pores may result when material is removed. In any event, the term "etch-processed" is a process limitation, and thus considered only with respect to the resulting structure. See MPEP and the cases cited therein.

Claims 1, 2 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Harris (US 4,328,080), cited by applicants.

Harris disclose a fuel cell electrode comprising platinum deposited onto silicon, which is first ion-etched, and thus "etch-processed" (column 1, lines 51-53). The silicon would also

include some oxide surface coating (column 1, lines 63-66), and would thus be "anodized", although some of the oxide is removed (column 2, lines 26-33). While porosity is not specifically mentioned, the electrodes would have to be porous in order to work in a fuel cell, as they are intended (column 1, lines 29-32). Since platinum is catalytically active (column 2, lines 8-12), the fuel cell constructed with this electrode would be operable to produce electricity from hydrogen and oxygen, or in reverse to electrolyze water.

Claims 3, 4, 10, 15, 17 and 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art applied above, or cited either below or by applicants, does not disclose or render obvious SiN as a porous substrate for use in a fuel cell, the recited pore size range, the recited film thickness, the present cells formed into a planar array of interdigitated electrodes, or the present cells in which the cathode has about four times the surface area of the anode.

Claim 19 is allowed. The prior art also does not disclose or teach a process of making and subsequently testing a plurality of fuel cells on a silicon substrate.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Matsumura *et al.* (US 4,774,152) disclose a fuel cell including a particulate reforming catalyst comprising silica. Maynard *et al.* (US 6,541,149) and Mallari *et al.* (US 2002/0128479)

Art Unit: 1745

disclose fuel cells with porous silicon components, but are filed too recently to be applicable under §102.

The disclosure is objected to because of the following informalities: The specification, on page 7, line 19, refers to "Fig. 1", but there is no figure 1 (without a letter). There are instead figures 1A and 1B. Appropriate correction is required.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

sjk


STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1700